



MARSHALL STAR

Serving the Marshall Space Flight Center Community

July 27, 2006

An interview with Jonathan Pettus, director of the Office of the Chief Information Officer **Integrating information technology to accomplish the mission**

How would you characterize the role of the Office of the Chief Information Officer in supporting the center's mission?

The Office of the Chief Information Officer is a technology and support organization, and this office ensures that all the investments we make are focused on enabling the core mission of the Marshall Center. If you look at our efforts during the recent shuttle mission and in preparing for the major events that are coming out of the Constellation Program, information technology has a key role. When people think about our office, a lot of times they think about the network, hardware and software applications, but it's an integrated set of tools and technologies that are used to make the center's operations run smoothly. Our role is to make sure that those products and services are available to accomplish the mission in an efficient and secure manner. That also means information technology security is extremely important. There's a lot of visibility for ensuring that the center's infrastructure is secure for collaborating, storing and using information.



David Higginbotham/MSC

Jonathan Pettus, director of the Office of the Chief Information Officer, believes the greatest strengths of the office are the diversity and breadth of the work done and the perspective of the center and the agency.

together as one organization. We have offices responsible for information technology security; software applications, Web and multimedia services; networks, telecommunications and desktop services; and data center services. The data center is the location for the computing servers that run applications such as e-mail, as well as our financial systems and engineering applications. We have another office that focuses on information technology planning, policy and governance as it relates to the strategy, investments and architecture at Marshall.

From an integrated management plan perspective, we have a competency center off-site, where a set of business and technology experts work to support agencywide applications such as financial management, travel, and time and attendance. We also are involved with information technology management issues that are not directly in the Office of the Chief Information Officer, but are important in terms of how we operate at the center.

How is the OCIO organized and how does it operate at the Marshall Center?

We recently reorganized as part of the overall center realignment. The major thing we accomplished was to combine the Integrated Enterprise Management Program and the Chief Information Officer organizations. This has proven beneficial because now we have all the agency information technology initiatives that we support, as well as local center information technology projects, working

together as one organization. We have information technology managers that support other Marshall organizations that have a dual role in working with our office to ensure we understand the requirements of their organization. We also coordinate information that is collected and reported back to NASA Headquarters about the use of information technology at the center, such as budgets, security and planning. We're responsible for responding to the agency's needs and it also provides a way to coordinate with other center organizations.

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Next shuttle mission to resume space station assembly

By Sanda Martel from combined reports

The stage is set to resume assembly of the International Space Station after a smooth landing by Space Shuttle Discovery at the Kennedy Space Center, Fla., on July 13.

Atlantis is scheduled to launch no earlier than Aug. 28 for a 12-day mission to the International Space Station. Mission commander Brent Jett Jr., a veteran of three space missions, will lead the STS-115 crew on the 19th mission to the station. The Atlantis crew is scheduled to deliver and install the P3/P4 truss segment along with solar array

set 2A and 4A and batteries to continue constructing the station. Joining Jett on the mission are three other space shuttle veterans — mission specialists Joe Tanner, Dan Burbank and Steve MacLean. Rounding out the crew are pilot Chris Ferguson and mission specialist Heidemarie Stefanyshyn-Piper, both making their first spaceflight.

The orbiter Atlantis, which lifted off on its maiden voyage Oct. 3, 1985, will make its 27th trip to space. Atlantis last flew in October 2002 for STS-112, when it delivered the S1 integrated truss segment



The crew of STS-115 takes a break from training to pose for a portrait. From left, front row, pilot Christopher J. Ferguson and commander Brent W. Jett Jr. Back row, from left, mission specialists Heidemarie M. Stefanyshyn-Piper, Joseph R. Tanner, Daniel C. Burbank and Steven G. MacLean, who represents the Canadian Space Agency.

to the space station. The vehicle also has delivered several other vital components to the station, including the U.S. Destiny Laboratory and the Quest Joint Airlock modules.

STS-115 will mark the return to construction of the station, the main goal of the remaining space shuttle flights. The P3/P4 segments, which are approximately 45.3 feet long, will attach to the P1 truss on the port side of the station's integrated truss segment. Once in place, the P3/P4 trusses, with their two large solar arrays, will provide one-fourth of the total power-generation capability of the completed station.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.



Atlantis rolls to the Vehicle Assembly Building, Monday, July 24, after being readied in the nearby Orbiter Processing Facility for its next mission. Once inside, the orbiter will be joined to the external tank and twin solid rocket boosters that will carry it into space.

'Once-in-a-lifetime' invitation

Marshall's Space Shuttle Launch Guest Program helps spread the word about NASA's mission

By Bill Hubscher

Their television may be the closest many Americans will ever come to seeing the launch of a space shuttle. Yet, thanks to the Marshall Center's Space Shuttle Launch Guest Program, more than 7,000 people have had the opportunity to view shuttle launches in the past 15 years as NASA's special guests.

"The Marshall Center wants to share the experience of a shuttle launch with those who can communicate the tremendous benefits of the space program to a large and diverse audience," said Shar Hendrick, manager of Marshall's Government and Community Relations Office in the Office of Strategic Analysis and Communications. "Our goal is to provide this experience to policy makers at the federal, state and local levels, and leaders from academia, industry and civic organizations."

Organizations from across Marshall nominate launch attendees for every mission. The Government and Community Relations Office takes great care in offering invitations to ensure the guests meet the criteria set for the program by NASA Headquarters in Washington, D.C., said Hendrick.

For the Space Shuttle Discovery's STS-121 mission, Marshall invited 206 guests, each of whom could bring one additional person, to the successful Independence Day launch.

Dr. James Hales, dean emeritus and special assistant to the president at East Tennessee State University in Johnson City, and his wife, Jane, were among those guests. In an interview after the launch, Jane Hales said the combination of celebrating Independence Day with experiencing a shuttle launch was awesome.

"I was determined we were going to stay for the launch, despite the two postponements due to the weather," Jane Hales said. "When it finally went up, it was thrilling. I cried because it was such an emotional and beautiful thing to see on the day we celebrate what makes our country great. It made me proud to be an American."

For Guy Collins, a world and European history teacher at Grissom High School in Huntsville, the decision to accept his invitation was an easy one.

"My wife, two daughters and I changed our vacation plans as soon as I got the invitation," Collins said. "It's not every day you get the opportunity to watch something like that. It was simply amazing."

While the launch itself can be a once-in-a-lifetime experience, Sandra Turner, Marshall's chief of protocol, along with others in the Government and Community Relations Office, makes sure the trip includes much more than simply watching the shuttle fly.

"We do everything we can to make sure a guest's experience is a memorable one," Turner said. "We brief the guests about security issues, what they will see and any possible changes in the schedule. We



From left, Debbie Collins, Guy Collins and Whitney Collins of Huntsville pause during their tour of the Kennedy Space Center, Fla., to get a better look at the Vehicle Assembly Building, where space shuttles are mated to the external tank and solid rocket boosters before being moved to the launch pad. The family visited the Kennedy Space Center as guests of the Marshall Center, touring the facilities and witnessing the launch of the Space Shuttle Discovery on July 4.

arrange and escort private tours of the Kennedy Space Center for the guests, showing them the Vehicle Assembly Building and the various launch pads. Guests learn about the Vision for Space Exploration and how the shuttle will help complete construction of the International Space Station, as well as learn about NASA's new launch vehicle systems — Ares I, the crew launch vehicle, and Ares V, the cargo launch vehicle — that support NASA's exploration goals to return to the moon and travel throughout our solar system. We give our guests further insight into the space program at receptions where they meet and interact with astronauts and other NASA personnel. We want to

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Data matrix tracks shuttle tiles to engine turbine blades

By Lori Meggs

The technology that automatically identifies NASA components — from space shuttle tiles to engine turbine blades — has been named the Marshall Center's Invention of the Year.

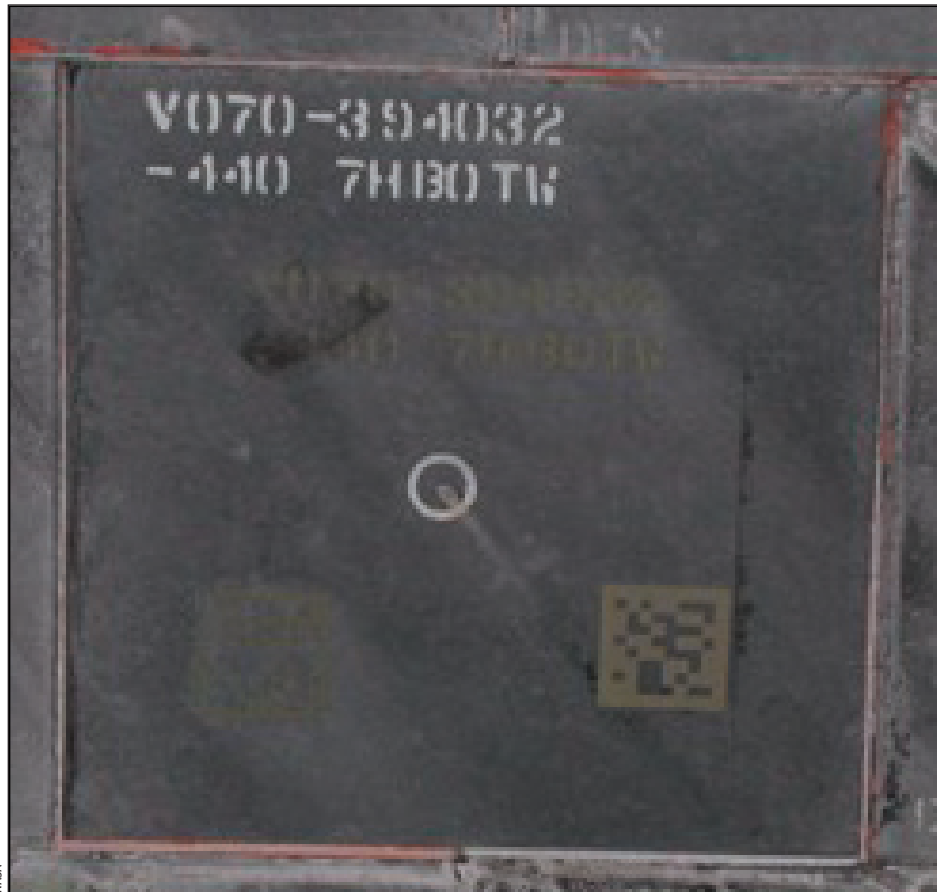
The honored invention, called the Data Matrix Family of Solutions, includes nine patents, a NASA technical standard and handbook, and an array of marking technologies used to identify, or "barcode," product parts.

Not too many years ago, most people had no idea what a barcode was or what the automatic identification industry was all about. Now

"barcode" is a household word, thanks to most of the products we buy in grocery stores. A barcode simply identifies a product, allowing for easy tracking.

But the markings that track a can of food are far different from technology that identifies products flown in space. There are many symbol structures other than barcodes, and data matrix is probably the most common one, now frequently seen printed on envelopes we receive in the mail. But parts flown in space are not like envelopes or cans with paper labels, so applying a data matrix for tracking requires a lot of science.

The environment for most space parts is too hot, too cold, too abrasive or too wet for labels or ink to survive. So Marshall Center engineer Fred Schramm worked to develop a survivable type of barcode. The data matrix, with its accompanying marking



A heat tile on Space Shuttle Discovery shows a matrix symbol marking, at the tile's lower right corner, that is still readable after 17 flights in space.

and reading methods, is now being planned for use NASA-wide to mark identification directly on parts that must endure hostile environments. The Data Matrix Family of Solutions includes more than 50 parts-marking technologies and four different scanner technologies for reading the marks. One of the marking methods involves a Marshall-developed thin film technology called vacuum arc vapor deposition that can make a data matrix so thin that it can possibly be put on a sealing surface without affecting performance of the part. This technology was developed while learning to do weld repairs in the vacuum of space.

The data matrix symbol was developed commercially in the early 1980s by people working with the signals sent into space to find other life or with signals received from distant exploration satellites. The return signals had to be corrected if certain

aspects of the signal were lost. This correction process formed the basis for the data matrix symbol structure and correction capability in case the structure got damaged.

The symbol itself resembles a checkerboard. Like a barcode, it encodes data. Data matrix is read with a digital camera type scanner instead of a laser-based scanner that is used for barcodes. While a barcode cannot be made much smaller or marked easily and read effectively on shiny metal surfaces, a data matrix

symbol has no such limitations. Applying

the identity of a part to its surface is the only known manufacturing process that is common to every NASA part.

"I have been blessed to work for an employer that encourages innovation, funds good ideas, provides support and encouragement and then rewards successes," said Schramm, the principal innovator for the data matrix technologies. "It took me 20 years to do all the things that went into this family of solutions, and every time I looked over my shoulder, a bunch of supporters were there." The marking processes were developed over the years with Rockwell International in Huntsville and then commercialized by Robotic Vision Systems Inc. in Nashua, N.H.

For the past several years support has even come from other government agencies, such as the Department of Defense's

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Marshall Center hosts scientific symposium



Marshall Center Deputy Director Charles Chitwood, left, participates in the roundtable discussion, "Advancing the Vision for Space Exploration," as Dr. Martin Weisskopf, project scientist for NASA's Chandra X-ray Observatory, looks on. The discussion was part of a science and technical symposium, "NASA S.P.A.C.E.: NASA Scholars Pursuing Academic and Career Excellence," hosted by the Marshall Center and held in Huntsville last week. Nearly 200 people attended from universities across the country and NASA's 10 field centers. Event organizers hope the discussions will help foster new research and technology development between NASA and its academic colleagues.

Enmett Overly/MSFC

During last week's symposium, Willie Love, second from right, assistant director of the Marshall Center's Office of Diversity and Equal Opportunity, accepts the History of Excellence and Service Award from the 2006 NASA Administrator's Fellowship Program, the Harriet G. Jenkins Pre-doctoral Fellowship Program and the Curriculum Improvement Partnership Award Program. Presenting the award, from left, are David King, Marshall Center director; Mabel Jones Mathews, university programs manager in the Office of Education at NASA Headquarters in Washington; Harriet G. Jenkins, former NASA associate administrator for Equal Opportunity; and Charles Chitwood, deputy director of the Marshall Center.



Marshall to play Army in all-star softball game

Marshall employees will be challenging Army in an all-star softball game Thursday, July 27, at 6 p.m. The event will be held on Marshall's softball fields located at the corner of Rideout and Martin roads. Come watch the game and enjoy free food and drinks. Contact Jim Lomas at 544-8305 or Victor Pritchett at 544-5771 for more information.

Lunar e-Library puts space history to work

By Tracy McMahan

The Lunar e-Library — a searchable DVD collection of electronic documents and other resources — is now available to help managers, engineers and scientists put space history to work as they implement the Vision for Space Exploration.

“Our goal was to identify key lessons learned from Apollo and other lunar missions and shorten research time by putting information at users’ fingertips,” said Miria Finckenor, a materials engineer with the Environmental Effects Branch in Marshall Center’s Materials and Processes Laboratory. “We now have a treasure trove of information for designers and engineers working on lunar exploration.”

The Lunar e-Library focuses on Apollo/Saturn era documents and includes 870 complete electronic documents and 230 abstracts with source information for copyrighted and limited distribution material. The DVD library features an easy-to-use Acrobat-based search engine that uses key words to search the entire 1,100 documents and abstracts at once. It then lists the documents by relevance and takes the user directly to the key words in the various documents. An index is included, and the user can conduct advanced searches by title, author and other information criteria.

The Lunar e-Library was developed by NASA’s Space Environments and Effects Program, based at the Marshall Center, and Marshall’s Engineering Directorate’s Materials and Processes Laboratory.

“We shaped the Lunar e-Library to focus on several topics of interest to the space environments community,” said Dr. Dale Ferguson, Space Environments and Effects Program technical advisor and scientist in Marshall’s Environmental Effects Branch. “This DVD will benefit NASA employees and contractors who are studying lunar dust, potential lunar landing sites, radiation and many other aspects of living and working on the moon.”

The Lunar e-Library literature collection includes a complete set of the Apollo mission and science reports; the Apollo Experience Reports; the Saturn V Flight Evaluation Reports; Lunar Roving Vehicle documents; documents on lunar soil and lunar surface studies; historical documents with an emphasis on Apollo and lunar studies; lunar data and experiment documents from the Surveyor, Apollo, Clementine and Lunar Prospector missions; studies and lunar reference mission documents, including Space Exploration Initiative and the First Lunar Outpost documents. The DVD collection provides links to and descriptions of Web sites that include document sources, databases, images and video and oral history interviews.

The Lunar e-Library includes information on 16 focused

Obtaining the Lunar e-Library

By Tracy McMahan

The free DVD document collection is available to NASA and aerospace professionals and can be obtained by filling out two forms, located at <http://see.msfc.nasa.gov/ModelDB/ModelDB.htm>.

1. Click on SEE Product Access Form to fill out the first form and submit it online.
2. Under General on the Web site, click on Lunar E-Library – knowledgebase and print the SEE Product Access and Software Release Agreement Form. Fax it to Sopo Yung at 256-544-8480.

More details and computer system requirements are posted at see.msfc.nasa.gov/dmia/LunarELibrary.htm.

The document collection also has been added to a Space Environments and Effects wing of the Marshall Center Launch and Space Systems e-Library, which provides online access to historical propulsion documents for approved NASA employees and associated contractors and organizations on-site at Marshall. To find out more about LaSSE, go to lasse.nasa.gov/.

interviews conducted for the project. Interview topics address Saturn rocket design; the history of engine design from the early missiles to the space shuttle main engines; the Lunar Roving Vehicle design, dust problems, thermal control, lunar surface studies and project management; materials selection and materials processes such as welding; materials requirements and testing for metals and non-metals; and many aspects of the space environment with particular emphasis on materials durability and dust.

In addition to technical experts, the Space Environments and Effects Program consulted history experts including the Saturn V and Lunar Roving Vehicle archivist at the University of Alabama in Huntsville, experts at the Smithsonian National Air and Space Museum and Marshall Center historian Mike Wright.

The writer, a Qualis Corporation employee, supports the Engineering Directorate’s Materials & Processes Laboratory as a technology historian.

A treasure of knowledge now available at NASA's new space station science Web site

By Lori Meggs

Want the latest space station science news? Then look no further than your Internet browser. NASA's new International Space Station science Web site, created and managed by the Marshall Center's Office of Strategic Analysis and Communications, Public and Employee Communications Office, is now live.

The site at www.nasa.gov/mission_pages/station/science/index.html went live this month.

You can mine a treasure of knowledge about Expedition 13 — the current, 13th mission to the station. You'll find extensive information and fact sheets on science payloads and experiments crewmembers are performing — ranging from manufacturing new materials in space to how plants are grown.

The new site also will prove a useful resource for information about previous missions, with content from the former space station science Web site, and links to completed science experiments. Also available are lists of published papers and summaries of science experiment results, including information about crew health, findings about microgravity's effect on the human body and ways that information is

leading to advances in medicine on Earth.

"This Web site is specifically intended as a news media resource," said Lybrease Woodard, project manager for the Payload Operations Integration Function in the Mission Operations Laboratory in Marshall's Engineering Directorate. "And the public will find valuable information as well. We're pleased this is available as an easily accessible new resource for those who want to learn about the work we're accomplishing on the International Space Station."

To aid in NASA's mission to inspire the next generation of explorers, the site features information for students about educational experiments on the station. These include Educational Payload Operations, designed to teach students about the space environment, and EarthKAM, an experiment that allows students to pick sites anywhere in the world to photograph using a camera mounted in a station window.

Visitors to the site can view some of the students' photos snapped from the orbiting lab. And there's a link to "Saturday Science," programs videotaped for use in classrooms, and NASA educational products that featured astronaut Don Pettit during his mission to the station in 2003. Pettit shows

students how everyday items such as water and honey act differently in space.

Among its new features, the Web site allows visitors to discover, through specific science and engineering examples, how space station experiments are contributing to the Vision for Space Exploration. The Vision calls for space shuttles to return to safe flight to complete the International Space Station, and for the continued human and robotic exploration of the solar system.

"The space station is now a stepping stone to the future," said Julie Robinson, NASA's deputy program scientist for the International Space Station at the Johnson Space Center in Houston. "Results from experiments performed on the station are what will lead us to long-term exploration. You'll see our progress on this exciting Web site."

A strength of the Web site is a dynamic format that links to weekly overviews of science on the space station, and allows updating of results and accomplishments as they happen.

NASA's Payload Operations Center at Marshall coordinates all U.S. science activities on board the space station.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Joe Ritch, local BRAC committee chairman, to speak at Marshall Association luncheon Aug. 8

Joe Ritch, chairman of the Tennessee Valley Base Realignment and Closure committee, will speak at the Marshall Association luncheon Tuesday, Aug. 8, at 11 a.m. in Center Activities Building 4316.

Ritch will discuss the implications of the most recent BRAC decisions and describe effects of these decisions on the

Huntsville and North Alabama area.

The 2006 Marshall Association scholarships will be awarded at the meeting.

The luncheon is \$11 for Marshall Association members and \$13 for non-members, payable at the door. Employees planning to attend must contact Sharal Huegele at sharal.b.huegele@nasa.gov or call 544-7286 by noon Friday, Aug. 4.

The association membership fee has been reduced to \$12.50 for the remainder of the year and also can be paid at the door. The money goes directly into the fund that finances the annual scholarships awarded by the association.

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What is the greatest strength of the Office of the Chief Information Officer?

I would say our office's greatest strengths are the diversity and breadth of the work we do and the perspective we get of the center and the agency. We support every organization at the center. The roles that we have in both the center and agency provide us a holistic view of the business processes and disciplines that are required throughout NASA, from engineering, science and financial management to human capital management, policy and law.

Not that we're experts in those disciplines, but we touch those areas and support them. This gives us a broad view of what's happening across the center. It also enables us to better serve our customers and to provide input, from our integrated perspective, into matters that aren't working well across different organizations. You wouldn't expect information technology to necessarily have that role.

Because we work with different programs, we are sometimes in the middle of situations when there are issues between organizations about systems and information technology, for example between finance and engineering or between a program office and finance. This sometimes places our office in a role of facilitating, resolving, communicating and coordinating across boundaries.

What challenges do you face in managing such a large and diverse organization?

Because of the diversity and the breadth of what we do, prioritizing the information technology project investments that we make is probably the biggest challenge, mainly because we have limited budgets and resources. Also, the challenge for us is maintaining a good relationship with our customers — understanding their current needs and where they have issues with our responsiveness or our services. It's a challenge for us to be in tune with our customers on a day-to-day basis as deeply as we need to be. That's an area where we need to focus.

What role does Marshall's OCIO have in supporting the Vision for Space Exploration?

It starts with the infrastructure. We're talking about the networks, the computing infrastructure of hardware and software that support



David Higginbotham/MSFC

Pettus says information technology security is critical in accomplishing Marshall's mission and that all employees should take the proper precautions in guarding sensitive information.

the basic operations. Our office is responsible for managing the NASA Integrated Services Network — the telecommunications services for computer networking and video services. This same basic infrastructure is used not only at Marshall but across the agency. It is core to day-to-day business planning and implementing of the major programs of NASA's Exploration Systems Mission Directorate.

We also have a role in ensuring that information collected and assembled as part of the design implementation for all the components of our exploration programs is secure, especially from an information technology security perspective. That includes tools and technologies — applications that are associated with the program life cycle management and the computer-aided design components for the vehicles or the space systems.

Our role extends to ensuring availability and an integrated architecture for those tools. The integrated architecture is a blueprint so we understand all the components that we have today, how they fit together and how they need to evolve to support the mission for the future. Having that architecture is something that we facilitate.

What is your goal for the OCIO and how can each employee help to make that goal successful?

Our goal is to enable the mission of Marshall and the agency. We tend to be seen as order takers for information technology components, but we're more than that. We want to be viewed as an entity that helps ensure the efficient integrated use of information

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Launch Guest Program

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make sure each guest better understands NASA's and Marshall's missions after they've had this special experience."

When it comes to handling the challenge of escorting more than 200 people while handling unexpected schedule changes and launch scrubs, Turner gives a lot of credit to Pat Fuller and Gena Cox, protocol specialists who help Turner ensure everything goes smoothly. When weather issues twice postponed the planned launch of Discovery during STS-121, the protocol team immediately worked to adjust bus and escorting schedules for their visitors.

Not all the guests could stay to witness the launch. "But after the tours and briefings, the guests understood the need for the postponement due to weather," Turner said. "They understood that the shuttle is the most complicated vehicle ever flown, that safety is taken very seriously and the weather is beyond our control. Many of them told us they learned so much from the tour and from talking to astronauts and managers that the trip was worthwhile, even without the opportunity to see the launch."

The first launch someone witnesses often becomes a permanent memory and personal highlight. Hendrick recalls his first launch was the flight carrying the telescope for Chandra X-Ray to space in 1999. "The launch experience itself was overwhelming," he said. "But to see the reactions of the NASA team members who'd worked so hard for so many years of their careers on Chandra is a great memory — I will carry that with me forever."

First-time witnesses to a launch not only carry memories of the liftoff, but of the people they met along the way. While at Kennedy, Collins had a chance to speak with retired NASA astronaut and fellow Huntsville native Jan Davis, former director of the Safety and Mission Assurance Directorate at Marshall. Collins plans to pass along what he learned from Davis to his Grissom history students and hopes her story will especially inspire more young women in his classes to enter the math or science fields.

Collins was quick to give credit to Marshall's Government and Community Relations Office for a smooth and activity-packed trip to the Kennedy Space Center, a sentiment echoed by James Hales.

"We were treated so well," Hales said. "People from NASA kept thanking us for coming down and being there for the launch. We felt we should be thanking them for the opportunity."

Alabama Senate Democratic Majority Leader Zeb Little from Cullman was quick to accept the invitation for the launch — not only for himself, but also for his 8-year-old son, Peyton. "Everyone from Marshall made it an incredible experience for my son and me," Little said. "I know Marshall has always been vital to NASA's mission, but I learned so much. I think all Alabamians should be proud of the work done by NASA — and especially in Huntsville at the Marshall Center."

The launch may have even cemented Peyton Little's career choice. "He has always wanted to be an astronaut," said his father. "He'll have some great stories for 'How I spent my summer vacation' when he goes back to school."

Turner, who has witnessed about 80 launches, said each launch only increases her appreciation of the space program. "It is an exhilarating experience to see our work come to fruition and remind us what our mission is all about," Turner said. "It makes me aware of how lucky I am to live in a time of such incredible technological advancements and that I have had the opportunity to be a part of it."

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.



NASA astronaut Cady Coleman, seated, signs an autograph for 8-year-old Peyton Little and his father, Alabama Senate Majority Leader Zeb Little, both from Cullman, Ala. All three were attending a reception for guests of the Marshall Center visiting the Kennedy Space Center on July 4.

'Focus on Marshall' looks at world's flattest floor and planetary modeling

By Lori Meggs

Marshall Center employees can catch the newest edition of "Focus on Marshall," highlighting capabilities around the center, on Marshall TV beginning Tuesday, Aug. 1.

This month's program features a segment on the Marshall Center's Flight Robotics Laboratory, where objects float on a thin layer of air atop the world's flattest floor. Operations in this facility allow controllers to test techniques for spacecraft docking or remote-controlled robotics. Located in Building 4619, this facility is part of the Space and Vehicle Systems Department in Marshall's Engineering

Directorate.

A second segment features atmospheric modeling by the Terrestrial and Planetary Environments Team. The team has developed a series of computer models that can predict conditions on or near the surface of various planets. These computer models — called Global Reference Atmospheric Models, or GRAMs — can predict air winds, surface climates and atmospheric temperature, humidity and pressure. Marshall collaborates with the Jet Propulsion Laboratory in Pasadena, Calif., to operate these models in support of select missions, including the current Mars Reconnaissance Orbiter mission.

"Focus on Marshall" airs on Marshall TV and Desktop TV the first and third Tuesday and Thursday of each month at 11 a.m., noon and 1 p.m. It also will be posted on Inside Marshall and the Marshall home page within the NASA portal Web site.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Pettus

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technology at Marshall and the agency to accomplish its mission. The word "integrated" is important here. Because as we deal with the challenges relative to implementing the Vision — completing the shuttle missions and work on the space station and performing the science work that we do — our budget is obviously one constraint in accomplishing all those missions. So, an efficient, integrated use of information technology is the way for us to accomplish the mission within our budget.

From an internal perspective, our employees should be focused on understanding the needs of the customer. We call that relationship management. We need to better understand our customers' needs and help our customers understand some of the challenges we face so we can communicate well.

For employees external to our organization, there are three main ways they can help us. First, help us with communication so we understand their requirements and when we're not meeting their expectations.

Second, understand and think about needs to ensure that our investments are integrated — that means analyzing the situation before we invest in and implement a certain solution. They need to ask themselves these questions. Are there other solutions we may already have that can meet those needs? And how will those solutions need to be integrated with what they're doing? Thinking more globally about the needs of the center and the agency, and less about a specific information technology need, is important for us to accomplish the goal of being integrated and efficient.

Third, be aware of securing information. Understand what kind of information is on your computer. Protecting information assets at NASA is the responsibility of all our employees. Thinking about security and being aware of what it takes to protect our information assets can help us accomplish the mission.

Your organization supports several agencywide information technology initiatives — can you tell us about those?

One I already mentioned is the NASA Integrated Services Network program, which is managed by the Space Operations Mission Directorate. We are responsible for the implementation of that program, and that includes mission and institutional networking communications services. In addition, we support the Integrated Enterprise Management Program, which implements a set of business applications that are used throughout the agency.

I also mentioned that our office is responsible for the NASA Data Center. That's the infrastructure that houses the computing systems that are used across the agency. From a center perspective, the agency information technology work we manage here at Marshall generates about \$250 million. In terms of revenue for the center and in addition to the overall budget, it generates about \$40 million worth of full cost revenue.

It's an important piece of Marshall's financial operation and business, though that's not why we do it. The agency relies on us to fulfill the need for this type of data infrastructure. Although it's challenging, we take a lot of pride in it and believe we do it well.

What does the future look like for information technology within Marshall and NASA?

I think it's bright because work is tremendously dependent upon information technology. There's a lot of opportunity for people who are interested in this field to apply their skills and interest at NASA and Marshall, based on the work that we have to do going forward. I think the budgetary climate of the future will dictate the focus on integration and wise investments in information technology. We'll have challenges, but it's a great opportunity.

Jessica Wallace, the Marshall Star editor, contributed to this article.

Data matrix

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Office of the Secretary of Defense to fund operational testing and the United States Coast Guard's Aircraft Repair & Supply Center in Elizabeth City, N.C., for real-world test cases. Add to that the automotive, electronics and aircraft industries that adopted the data matrix symbol in their part-marking standards and the commercial partners that joined the effort to build the scanners that read through paint.

Each year NASA tracks millions of parts, even tiny electrical parts no larger than a dime. The configuration management, engineering, logistics and business databases all depend on each part having its identity, or part number, marked directly on it. The process enables accurate linkage to the databases — one important step in ensuring flight safety.

Just imagine a part that does not have its identity marked on it. How does it get tracked during its entire life cycle once it is installed? And just imagine those parts that have only human-readable characters on them. The process of humans writing down that information or keying it into a computer is error prone, and the mistakes could be costly. The data matrix enables a mark on every part and accurate tracking. Capturing part identity in NASA operations, whether on earth, moon or Mars, should be as easy as checking out at the grocery store.

Since 1987, data matrix symbols have been applied to more than 80 different materials, including metal, plastic, glass, paper, fabric and ceramics. Their flexibility is ideal for small and delicate items, such as those seen in electronics and aerospace components. Identification is

permanent and may be read accurately for the life of a part.

Markings can be hidden or covered by paint, cork, foam or other protective coatings. In the early 1990s while the rest of the world was limited to reading symbols that were visible, NASA began the process of developing ways to read symbols through layers of coatings using sensor-based scanners. The two most popular methods use magnetic and ultrasonic handheld scanners that can read through up to six layers of paint.

There also is a method for incorporating chemical or "secret" barcodes in or on products for security and authentication. Known as Nanocodes, these mixtures of chemicals that decode to a data matrix format are being matured by some of NASA's partners for use in carpet as well as rockets. The family of solutions now has been tapped for use in the Constellation Program — the program that will build the launch vehicles and spacecraft to carry future generations of explorers to the moon, Mars and destinations beyond. The logistics plan is being drafted, and product identification that will endure the rigors of space is one of the central topics.

"It's exciting to know that something I started developing for NASA in 1986 is now being recognized as the usable, mature version of part identification for flight safety for the new Constellation Program," said Schramm. "These technologies need a place to work and we finally have a home for them."

The Data Matrix Family of Solutions was inducted into the Space Foundation's Space Technology Hall of Fame in 2001.

The writer, an ASRI employee, supports the Office of Strategic Analysis and Communications.

Classified Ads

To submit a classified ad to the Marshall Star, go to Inside Marshall, to "Employee Resources," and click on "Employee Ads — Submit Ad." Ads are limited to 15 words, including contact numbers. No sales pitches. Deadline for the next issue is 4:30 p.m. Thursday.

Miscellaneous

Radio Flyer all-terrain red wagon, wooden side rails, large rubber tires, \$100. 353-0370
Sofa, \$300; two wingback chairs, \$75; two end tables, \$125, coffee table, \$150. 256-881-8046
Trampoline, 14' diameter, \$100. 830-2806
Refrigerator w/ice maker, \$200; moving boxes, free. 651-7640
2003 Epiphone Casino guitar w/hard case, \$550. 746-9080/leave message
Four welding tanks: 5-gallon oxygen; 2-gallon & full 5-gallon acetylene; 2-gallon argon; \$100 for all. 325-2070
Music stands, \$5/\$10; Gibson soft case, \$10; guitar stands, \$10 each; Korg pedal, \$20. 468-6016
Aquarium with metal stand, 40-gallon, includes lighted hood, filter, pump, and accessories, \$50. 931-438-1730
Two Queen Anne loveseats, neutral background, mauve floral print, \$150; 4-wheeled, 3-tiered cart, \$15. 256-603-3558
eMachines 17" SVGA CRT monitor, 3View 17f3, Model #786N, \$90. 256-722-0997
Gray/white male Schnauzer, 3 yrs. old, house/kennel

trained, shots up to date, \$100. 682-7007
Murray riding lawn mower, 14HP, 36", \$250. 658-3901/evenings
King trombone, case and accessories, \$150. 880-7378
Golf clubs, men's left-handed, woods 1/3/5, irons 3/9, PW, SW, putter, no bag, \$150. 882-3983
Dobsonian telescope, f/4.8, customized 12.5", 80mm finder, 2" filter wheel, cooling fans, more, \$1,250. 883-9361
L-shaped solid Oak computer desk, \$450. 256-683-4151
Gun display cabinet, \$170; antique platform rocker, \$200; Oak desk, \$90; two toy chests. 881-5093
Blue sofa, \$120; loveseats, \$120; computer desk, \$50; queen headboard, \$75 ladies clothes, \$10/\$20. 534-0939
Registered boxer puppies, 4 females, 3 males, \$250 each. 931-937-6220
Utility trailer, 5'x8', steel frame w/wood panels, \$650. 256-783-9010
Utility trailer, Snow Bear Model 8000, 54"x92", pre-wired, \$450. 256-679-2429
Two tickets; Section 310, Row B, Seats 18&2, AI Live Tour, Nashville, Aug. 10, \$60. 461-0096
Hofner 500/2 Club Bass, No. 82 of 100 handmade in Germany, w/case, papers, \$1,675. 303-3702

Vehicles

Gamefisher fiberglass boat, 12', with 9.5HP Evinrude motor and trailer, \$700. 256-694-1217
2004 KTM300 dirt bike. 256-508-9657/Bob
2003 Jeep Wrangler SE, white, 4-cyl., 38.5K miles, 31x10.5MTRs, adjustable shocks, \$13,900. 883-1874
1999 Stratos 295 Bass boat, 200 Johnson, GPS, 12/24, garage kept, \$13,900. 233-3407
1990 hardtop for red Mazda Miata. \$800. 256-682-9018
2002 Suzuki Volusia 800, 21K miles, plum color, \$5,100. 883-6415
1978 75th Anniversary Harley Sportster, less than 8K miles, mostly original, turn key bike, \$7,000. 256-351-2062

2004 Ford Explorer, leather, fully loaded, 32K miles, transfer at no cost. 797-1730
1979 Honda Z-50, runs well, \$375. 256-527-8116
1988 Chevy S-10 pickup, 4-cylinder, 5-speed, \$1,300. 256-509-8794
1958 Chevy Apache pickup, \$10,000; \$8,000 without parts. 777-6167
2000 Geo Metro LXI sedan, burgundy, auto, cold a/c, CD, 75K miles, 40 mpg, \$2,500. 256-527-8798
1994 Ford Crown Victoria, white, runs well, \$1,300. 684-5712
2002 Honda Accord EX, V6, auto, white, power, leather, sunroof, multi-CD, 60K miles, \$14,500. 497-5789
1997 Honda Accord, 4-cylinder, gold w/tan cloth, automatic, 4-door, 110K miles, \$3,800. 256-564-8398
2003 Chrysler PT cruiser, red, 47K miles, Touring Edition, cruise, CD, PW/PDL, \$9,900. 256-682-1350
1981 Chevy truck, all original, V8/350, SWB, straight body, primed, ready to paint, \$3,500. 783-2637
Villian II ski boat, new motor, \$2,800. 679-0073
1995 Deville, black, loaded, 214K miles, \$2,500; 1996 Deville, 157K miles, loaded, leather, \$3,250. 256-420-2802

Wanted

Containers you plan to discard, quart to 5-gallon, with/without holes for plants. 520-4930
Dish Network receiver. 256-572-7396
Various men's scuba gear items: need regulators, BCD and Dive Computer in great condition. 256-221-0644
Yamaha Clavinova digital piano in good condition. 256-881-6076

Free

Kittens to good home. 256-739-2601
Firewood, you cut/you haul. Harvest area. 651-9201

Lost

Folding knife, Sheffield stainless and wood, 3" blade, Bldg. 4200 complex or Bldg. 4471. 650-5427

Marshall helps educators with lesson in rocketry



Emmett Given/MSFC

Teachers had the opportunity to fire rockets they built themselves while attending the Advanced Rocketry Workshop at the Marshall Center July 19-23. The Marshall Academic Affairs Office invited teachers from 15 states whose students placed in the top 25 at the Team America Rocketry Challenge in The Plains, Va., in June. Educators who attended the workshop learned more about rocketry and NASA's Student Launch Initiative, which challenges students to build rockets and a scientific payload of their own design, to exhibit and to fly them at a rocketry event at Marshall in May 2007. Along the way, the students are mentored by NASA scientists and engineers at Marshall, who will also help them with design reviews.

MARSHALL STAR

Vol. 46/No. 44

Marshall Space Flight Center, Alabama 35812
(256) 544-0030
<http://www.nasa.gov/centers/marshall>

The Marshall Star is published every Thursday by the Public and Employee Communications Office at the George C. Marshall Space Flight Center, National Aeronautics and Space Administration. Classified ads must be submitted by 4:30 p.m. Thursday, and other submissions no later than 5 p.m. Friday to the Marshall Public and Employee Communications Office (CS20), Bldg. 4200, Room 103. Submissions should be written legibly and include the originator's name. Send e-mail submissions to: intercom@msfc.nasa.gov. The Star does not publish commercial advertising of any kind.

Manager of Public and Employee
Communications — Dom Amatore
Editor — Jessica Wallace

GPO U.S. Government Printing Office 2006-523-050-20059

PRSR STD
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PERMIT NO. 298